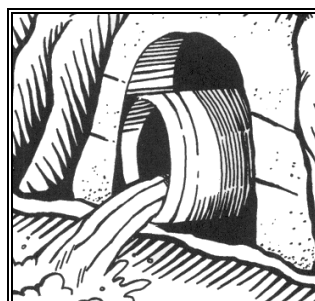
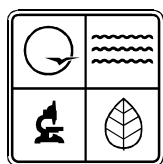


Wastewater Systems



Preventing Pollution in Wastewater Systems

A Guide to Environmental Compliance
and Pollution Prevention for
Wastewater Systems in Missouri



MISSOURI DEPARTMENT OF NATURAL RESOURCES

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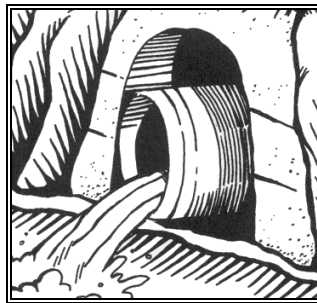
The information in this publication is intended as general guidance only. For specific requirements, the reader should consult the appropriate federal and state laws and rules.

Funding for development and printing of this document was provided in part by a Pollution Prevention Incentives for States grant from the U.S. Environmental Protection Agency.

*For more information call 1-800-361-4827 or write to
Missouri Department of Natural Resources
Environmental Assistance Office
P.O. Box 176
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March 2002

Wastewater Systems



Preventing Pollution in Wastewater Systems Guide Sheet #1

As environmental protection becomes more and more important, industries of every type are faced with some big questions.

What environmental regulations apply to my facility and me?

How do I comply with those regulations?

Are there things I can do to reduce the number of regulations I must meet?

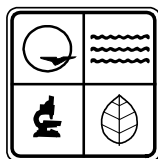
How can I protect myself from fines and liability?

How do I protect my workers and myself from environmental hazards at work?

This publication can help wastewater treatment facilities in Missouri answer some of those questions. The guides provide basic information about regulatory requirements and suggestions for protecting yourself, your workers and the environment through pollution prevention.

Each guide sheet deals with a separate issue that you may face at your wastewater treatment facility. The guides will not answer every question you have. After reviewing them, you should be able to decide if you need more information or help on a particular issue. The topics are listed on the back of this page.

The Missouri Department of Natural Resources has an Environmental Assistance Office (EAO) to help you comply with environmental regulations and find ways to prevent pollution. If you need help, call EAO at 1-800-361-4827.



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Guide Sheets for Wastewater Systems

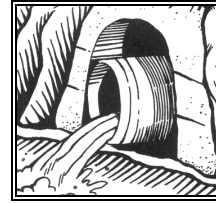
Guide Sheet #2, Pollution Prevention
Guide Sheet #3, Backflow Prevention
Guide Sheet #4, Chemical Risk Management
Guide Sheet #5, Confined Space Safety
Guide Sheet #6, Energy Efficiency
Guide Sheet #7, Hazardous Products and Waste
Guide Sheet #8, Lamps
Guide Sheet #9, Operator Certification
Guide Sheet #10, Permits
Guide Sheet #11, Pretreatment
Guide Sheet #12, Safety for Wastewater Systems
Guide Sheet #13, Sludge Biosolids
Guide Sheet #14, Solid Waste
Guide Sheet #15, Used Oil Recycling and Disposal
Guide Sheet #16, Wastewater Contacts
Guide Sheet #17, Wastewater Laboratories
Guide Sheet #18, Wastewater System Management

If you have comments or ideas for ways to improve these guide sheets, please let us know by calling EAO at 1-800-361-4827.

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Pollution Prevention

Wastewater Systems



Wastewater collection and treatment systems vary from community to community depending on the population size and local needs. Such systems may separate the storm and sanitary flows, or have a combined sewer system, or both. Wastewater collection and treatment systems are responsible for collecting and treating residential, commercial and industrial wastewater. All of the practices and procedures used to collect and treat wastewater have the potential to pollute. State and federal environmental regulations control wastewater discharges in an effort to protect water quality. The regulations describe how water contaminants should be controlled, treated and disposed of. A better way to protect water quality is to minimize water contaminants and to reduce or eliminate treated effluent discharges.

What Is Pollution Prevention?

Pollution prevention is not producing waste in the first place. It means doing what we can to reduce the amount and toxicity of waste we generate. Reducing, reusing or recycling wastes helps minimize the need to treat and dispose of it.

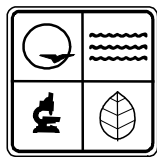
Pollution prevention can be as simple as encouraging water conservation, or as complex as designing an operation to use treated wastewater as a substitute for traditional sources of water. Pollution prevention requires thinking about the environmental impact of your actions and working to limit that impact.

Why Prevent Pollution?

When we generate waste or pollution, we must safely and legally manage that waste or pollution. There are great opportunities for wastewater treatment plants to prevent pollution. Wastewater treatment plants have the obligation to act as pollution prevention role models for their residential, commercial and industrial customers and to help or require dischargers to reduce the volume, strength and toxicity of their discharges to sewers through education, assistance and regulatory programs.

When a treatment plant reduces the amount of waste it produces, it usually saves money. Reducing costs is a major reason to prevent pollution. Here are a few others:

- Improved work environment and worker safety.
- Better environmental protection.
- Reduced liability.
- Enhanced public relations opportunities.



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What Can Be Done At Wastewater Treatment Operations?

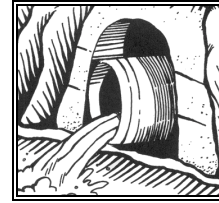
There are several measures that communities and wastewater treatment plant operators can do to prevent pollution at treatment plants. Each of these guide sheets have suggestions on ways to prevent pollution. Here are a few general tips:

- ✓ Maintain sewer lines and wastewater treatment facilities to prevent unintended or untreated discharges to waterways.
- ✓ Keep hazardous chemicals out of sewer lines to protect workers, the plant and the public's investment.
- ✓ Adopt a preventative maintenance program to predict problems before they occur rather than reacting to them after an occurrence.
- ✓ Explore, evaluate and implement alternatives to existing wastewater treatment processes, such as ultra violet disinfection in order to avoid toxic chemicals such as chlorine, hypochlorite and chemicals needed to "dechlorinate."
- ✓ Track and post statistical control tools so all employees know at what level the plant is operating and what optimal operation levels are.
- ✓ Establish a screening mechanism for purchase of chemicals to evaluate less toxic alternatives.
- ✓ Evaluate opportunities for energy savings.
- ✓ Explore and implement wastewater reuse options. Possible alternatives include:
 - Irrigation of crops and pasture land.
 - Irrigation of golf courses and public parks.
 - Commercial uses such as vehicle washing facilities, window washing, mixing water for pesticides, herbicides and liquid fertilizers.
 - Dust control and concrete production on construction projects.
 - Fire protection
 - Toilet and urinal flushing in commercial and industrial buildings.
- ✓ Encourage water conservation measures in the community. Possibilities include:
 - Locate and repair leaks.
 - Install water efficient showerheads and faucets.
 - Wash only full loads in dishwasher and washing machine.
 - Replace toilets with low flow models.
 - When replacing appliances purchase high efficiency models.
- ✓ Restrict the emission of excessive odor matter. (See 10 CSR 10-2.070, 10 CSR 10-3.090, 10 CSR 10-4.070 and 10 CSR 10-5.160 for odor regulations. These can be found at: www.mosl.sos.state.mo.us/csr/10csr.htm)

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Backflow Prevention

Wastewater
Systems



Backflow is the unwanted reversal of flow in a water distribution system. It can occur due to changes in the hydraulic pressure in a water piping system. A cross connection is a physical link connecting a source of pollution or contamination with a potable water supply. If there is a cross connection in your facility and backflow occurs, the potable water supply can become contaminated. Backflow prevention assemblies located at the customer service line and at points of potential contamination help to prevent this problem.

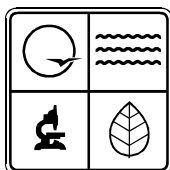
Missouri Department of Natural Resources backflow prevention regulations consider sewage treatment plants, pump stations and chemical laboratories to be potential Class I backflow hazards. A Class I backflow hazard presents a health hazard to customers of the public water system. If these facilities are connected to a public water supply, they must meet the backflow protection requirements of the regulation. The facility must either construct an air-gap separation to department specifications or install a department approved reduced pressure principle (RP) backflow prevention assembly on the facility's service line. Regulations require annual inspection or testing of the back flow protection by a state certified tester.

Your local water supplier and local plumbing codes may require additional backflow prevention devices. Contact your water supplier and local municipality to learn about their requirements.

Facilities connected to a private water supply should install backflow prevention devices to protect employees from the risk of contaminated drinking water. The Department of Natural Resources maintains a list of approved backflow prevention assemblies. To get a copy, call the Public Drinking Water Program at (573) 751-3111.

Remember

- If your facility is connected to a public water supply system, you are required to have backflow prevention on the customer service.
- It is a good idea to put additional backflow preventers at any location in your facility where contamination could occur.
- If your water supply is a private well, backflow prevention is also important.
- Report any backflow occurrence to your water supplier immediately. This will allow them to take steps to protect the public.



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Preventing Pollution can save money, protect the environment and reduce risk to people. Here are some suggestions:

- ✓ Never fill containers or tanks with water by placing a hose end below the water surface. Doing so makes a cross connection.
- ✓ Have plumbing installed by a professional and add backflow prevention at every appropriate point.
- ✓ Environmental Assistance Office personnel can review your facility for possible cross connections as part of a non-regulatory site visit, at your request.

Additional Information:

Cross-Connection Control Manual, United State Environmental Protection Agency, Office of Water, 4601, Revised 1989. – Copy can be downloaded from EPA Web site:
www.epa.gov/safewater/crossconnection.html

Missouri backflow regulations can be found at *10 CSR 60-11.010, Missouri Code of State Regulations* available on the Web at: www.mosl.sos.state.mo.us/csr/10csr.htm.

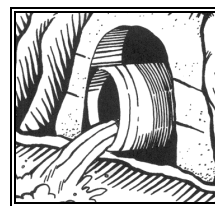
Department of Natural Resources Backflow Coordinator, Public Drinking Water Program, (573) 751-5331

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March 2002

Chemical Risk Management

Wastewater
Systems



Hazardous chemicals are sometimes used in the wastewater treatment process. If your facility uses and stores hazardous chemicals, you are responsible for ensuring that these chemicals are managed safely. The most common hazardous chemicals used at a wastewater treatment plant are chlorine, anhydrous ammonia, aqueous ammonia (in concentrations of 20 percent or more) and anhydrous sulfur dioxide. In addition, large quantities of methane gas (produced in sludge digesters) are sometimes stored on-site.

State and federal regulations under the Emergency Planning and Community Right-to-Know Act and section 112 (r) of the Clean Air Act require facilities to

- identify potential hazards posed by an accidental release of hazardous chemicals
- design and maintain safe facilities
- take steps to minimize the consequences of any release.

Reporting Requirements

Facilities that store large quantities of hazardous chemicals may be subject to planning and reporting requirements. Your facility is required to notify the Local Emergency Planning Committee (LEPC), the local fire department and the Missouri Emergency Response Commission (MERC) if your facility stores

- chlorine in quantities of 100 lbs. or more;
- ammonia (anhydrous or aqueous) in quantities of 500 lbs. or more;
- anhydrous sulfur dioxide in quantities of 500 lbs. or more.

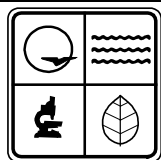
Notification is done by filing a MERC Tier II form with each agency within 60 days of the material being on-site. Updates of the Tier II forms are due on March 1 of each year. State law requires your facility to develop and submit a facility emergency response plan. You are also required to mark buildings, rooms and containers where these hazardous chemicals are kept.

If your facility has a **release** of

- 10 lbs. or more of chlorine;
- 100 lbs. or more of ammonia (anhydrous or aqueous); or
- 500 lbs. or more of anhydrous sulfur dioxide,

contact as soon as possible

- The department's 24 hour emergency number (573) 634-2436;
- Your LEPC or the appropriate response agency; and
- The National Response Center 1-800-424-8802.



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Provide as much information as possible when making phone notifications. Follow up with written reports to LEPC and MERC.

If your facility has more than the threshold quantity in a single process of the substances listed below, you are required to file a Risk Management Plan with the national EPA data center:

- 2,500 lbs. of chlorine;
- 10,000 lbs. of anhydrous ammonia;
- 20,000 lbs. of aqueous ammonia;
- 5,000 lbs. of anhydrous sulfur dioxide; or
- 10,000 lbs. of methane.

Remember

- Identify potential hazards and assess the risks.
- Design and maintain safe facilities.
- Minimize consequences of a release.

Preventing Pollution by planning for the safe handling, storage and usage of hazardous chemicals is important to the safety of employees and the surrounding community.

- ✓ Have a safety program in place that includes a written safety plan and a training program for employees (see *Wastewater Laboratories, Sheet#17*).
- ✓ Have an emergency plan for handling accidental spills or releases of harmful chemicals.
- ✓ Provide information to local fire department and local emergency response agencies.
- ✓ Maintain facilities, equipment and monitoring devices.
- ✓ Mark locations and containers where hazardous chemicals are stored.
- ✓ Assure adequate physical security of the facility site, chemical storage areas and chemical processes.

For additional information on this subject see the Web site for EPA's Chemical Emergency Preparedness and Prevention Office at www.epa.gov/ceppo. Or contact

Missouri Emergency Response Commission

P.O. Box 3133

Jefferson City, MO 65102

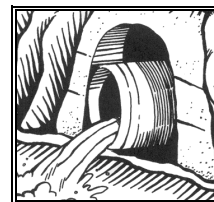
1-800-780-1014

www.sema.state.mo.us/mercc.htm

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Confined Space Safety

Wastewater Systems



Confined Spaces

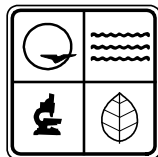
If your job takes you into places such as a pipeline, pumping station, septic tank, sewage digester, sewer, storage tank, or similar type enclosure, you are probably working in a confined space. Working in confined spaces can be dangerous or even fatal if proper precautions are not taken. The Occupational Safety and Health Administration (OSHA) defines a confined space as “any space having limited means of egress, which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere.” A confined space may have one or all of the following characteristics: limited openings for entry or exit, unfavorable natural ventilation or a design unsuitable for continuous worker occupancy.

Why are confined spaces dangerous?

In some cases, a confined space poses entrapment hazards or exposes employees to other hazards such as asphyxiating atmospheres or moving machine parts. Confined spaces by their very nature and configuration are dangerous to life and health. Many confined spaces are poorly ventilated, which creates an oxygen-deficient atmosphere and may accumulate toxic gases. Confined spaces are not designed for continuous employee occupancy. Little consideration has been given to the preservation of human life in the design of confined spaces.

Facilities requiring employees to enter confined spaces must have a confined space safety program. The confined space safety program should be written and include

- Documentation of existing confined spaces.
- A permit system in place to identify and monitor confined spaces.
- Provisions for atmospheric monitoring.
- Use of warning signs.
- Employee training.
- Proper use of protective equipment.
- An emergency response plan.



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Remember

- Confined space entry is one of the most potentially hazardous types of work performed by treatment plant workers.
- Confined space safety is not a matter of convenience or choice – it's the law.

Employee training is the key to a successful confined space safety program.
Here are some suggestions:

- ✓ Train employees **before** a confined space entry situation occurs.
- ✓ Training must be documented.
- ✓ Include in training an overview of what the standard requires and incorporate your organization's written training program.
- ✓ Train using personal protective equipment. (PPE)
- ✓ Participate in mock rescues to exercise your rescue plan.
- ✓ Perform basic first aid and cardiopulmonary resuscitation (CPR) – at least one employee must be CPR-certified.

Additional Information:

MOP 11, Chapter 5, *Occupational Safety and Health* New Edition of MOP 11, Volume I, Management And Support Systems.

Safety and Health in Wastewater Systems, WEF Manual of Practice No. 1

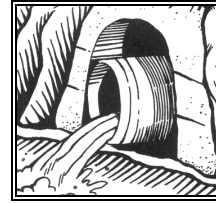
OSHA Web site: www.osha.gov/

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March 2002

Energy Efficiency

Wastewater Systems



Energy consumption at wastewater treatment plants is on the increase due to more stringent regulations and the customer's concerns about water quality. More and more utilities are turning to energy management to reduce operating costs. Electricity is typically billed in two ways: by the quantity of energy used over a period of time and by demand, which is the rate of flow of energy.

By conducting an energy survey of your wastewater treatment plant you can learn how each piece of equipment uses energy. With this information and how electricity is billed at your plant, you can develop a demand management strategy that will optimize your plants power usage.

The Missouri Department of Natural Resource's Energy Center is an allied partner with the Department of Energy's Motor Challenge Program and can provide assistance with selecting the most cost-effective motor for your operation. Your energy provider may also be a partner in the Motor Challenge Program and may be able to provide assistance.

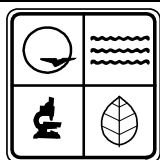
Missouri Department of Natural Resources' Energy Center
P.O. Box 176
Jefferson City, MO 65102
Phone: (573) 751-4000, 1-800-361-4827

Remember

- Electric motors account for 50 percent of all electricity used in the United States.
- Pump and blower motors account for 80-90 percent of energy costs in wastewater treatment plants.
- Reducing energy costs at the plant reduces sewer use rates to the customer.

Prevent Pollution by being energy efficient. Air pollution, hazardous waste, water pollution and nuclear waste are all reduced when energy use is reduced. Here are some suggestions.

- ✓ Conduct an energy survey at your plant.
- ✓ Examine electric rate schedules to determine your best use of electricity.
- ✓ Consider using energy efficient motors for all new installations, replacement of failed motors, or as spares.



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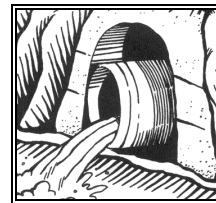
- ✓ Use variable-frequency drives in electric motors to allow precise control of processes and to save energy.
- ✓ Perform scheduled preventive maintenance on electric motors.
- ✓ Install energy efficient lighting and change how lighting is used to reduce energy costs.
- ✓ Install high efficiency heating, ventilation and air conditioning equipment (HVAC) to provide immediate cost savings.
- ✓ Explore reuse of energy at your plant. Anaerobic digesters have proven to be a reliable source of gas for electricity production or for thermal energy to heat work spaces.
- ✓ Use Supervisory Control and Data Acquisition (SCADA) systems to optimize plant processes and save energy.

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Hazardous Products and Waste

Wastewater Systems



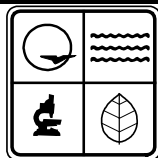
Your wastewater treatment operations may use hazardous products and produce hazardous wastes. A waste is a material you no longer use and will discard. It can be a solid, liquid or gas. Waste is hazardous if it has certain properties that could pose dangers to human health and the environment. Laboratory chemicals, oil-based paints, maintenance chemicals and pesticides are examples of products that when discarded could be hazardous waste.

It is **your** responsibility to find out if your waste is hazardous. A waste is hazardous if it is

- **A Listed Hazardous Waste** - The federal government publishes lists of hazardous wastes. There are four different lists: the F list, the K list, the P list and the U list. Wastes on the P list are called "acutely hazardous" and are regulated more strictly than other types.
- **A Characteristic Hazardous Waste** - Some wastes that are not on the lists may still be regulated hazardous wastes because they have characteristics that make them hazardous. There are four characteristics:
 - **Ignitable** - A waste with a flashpoint less than 140° F, solids that catch fire easily and burn so rapidly they create a hazard and some compressed gasses. Some solvents are ignitable.
 - **Corrosive** - A waste with a pH less than or equal to 2.0, or greater than or equal to 12.5. An example is battery acid.
 - **Reactive** - Wastes that are normally unstable, react violently with water, can explode or release poisonous gases.
 - **Toxic** - Wastes containing certain organic chemicals, heavy metals or pesticides when tested by the Toxicity Characteristic Leaching Procedure (TCLP). The chemicals considered toxic are included on a list in the federal regulations.
- **A Missouri-Specific Hazardous Waste** - An individual state may add to or amend the federal regulations. Missouri law regulates used oil and dioxin wastes more strictly than federal regulations.
- **A Mixed Waste** - If you mix any material with a waste that meets the definition of an F, P, K or U listed waste, the mixture is hazardous even if there is only a very small amount of listed hazardous waste in the mixture.

Is Your Waste Hazardous?

To determine if your waste is hazardous, check to see if it is on a hazardous waste list or if it is a hazardous waste in Missouri. If not, does it exhibit one or more hazardous characteristics? Check the label and the material safety data sheet (MSDS) or contact your supplier for information. If you are unsure if your waste is hazardous, you may have it tested in a laboratory.



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Managing Hazardous Wastes

There are very specific requirements regarding the storage, transporting, recycling and disposal of hazardous waste. The requirements you must meet depend upon the type and quantity of waste you generate. Determine whether the waste is acutely hazardous (P-listed) or non-acutely hazardous (all others). Next, determine how much of each type of waste you generate in one month or accumulate at any one time.

What Type of Generator Are You?

Here are some general guidelines to help you decide what type of generator you are.

If you generate in one month or accumulate at any one time:

- More than 1 kg (2.2 pounds) of acutely hazardous wastes you are a Large Quantity Generator (LQG).
- 1,000 kg (2,200 pounds) or more of non-acute hazardous waste you are an LQG.
- One gram or more of dioxin waste (2,3,7,8-tetrachlorodibenzo-p-dioxin) you are a LQG (state of Missouri regulation).
- More than 100 kg (about 220 pounds), but less than 1,000 kg (2,200 pounds) of non-acute hazardous waste **and** less than 1 kg of acutely hazardous waste you are a Small Quantity Generator (SQG).
- No more than 100 kg (220 pounds) of non-acute hazardous waste **and** less than 1 kg of acutely hazardous waste you are a Conditionally Exempt Small Quantity Generator (CESQG).

If you are a **SQG** or **LQG** you must register with the department and get a generator identification number. You also must follow regulations for storage, transport, record-keeping and reporting. Call the department at (573) 751-3176, or 1-800-361-4827, to learn the specific requirements for managing your waste.

Remember

- Identify any hazardous wastes generated at your facility.
- Determine what type generator you are.
- Contact the department for the state and federal requirements for managing your hazardous wastes.

Preventing Pollution can save money, protect the environment and reduce risk to people. Here are some suggestions.

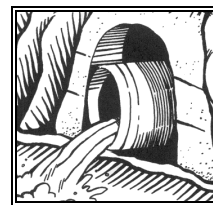
- ✓ Source reduction is the best choice for hazardous waste management. When possible, replace hazardous products with non-hazardous alternatives.
- ✓ If source reduction is not possible, resource or energy recovery is the next best alternative.
- ✓ Don't mix hazardous and non-hazardous wastes.
- ✓ The Environmental Assistance Office (EAO) provides non-regulatory site assessments that help facilities identify and manage hazardous wastes. Contact EAO at (573) 526-6627 or 1-800-361-4827.

Note: Federal hazardous waste requirements: *Code of Federal Regulations*, Title 40, Part 260 through Part 280 (40 CFR 260-280). Missouri Hazardous Waste Law: *Revised Statutes of Missouri* (RSMo), Sections 260.350-260.575. Missouri Hazardous Waste Rules: *Code of State Regulations*, Title 10, Division 25 (10 CSR 25). For additional information call the federal government's Superfund/RCRA Hotline at 1-800-424-9346.

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Lamps

Wastewater Systems



Fluorescent, ultraviolet, high-pressure sodium, mercury vapor, metal halide, neon and high intensity discharge lamps contain mercury, as well as other toxic metals. Unbroken lamps pose no threat to human health and the environment and may be managed as universal waste. Broken lamps may pose a health threat due to inhalation of mercury vapor and other metals. Broken lamps are hazardous waste.

Hazardous vs. non-hazardous lamps

Mercury-containing lamps are likely to be hazardous. There are two methods to determine if lamps are hazardous:

1. Apply knowledge of the hazardous characteristic. Lamp manufacturers may be able to provide data that show the toxic metal levels for the lamps you use. If the toxic metal levels are unknown, assume the lamp is hazardous.
2. Test the waste. The test to find out the toxicity of lamps is the Toxicity Characteristic Leaching Procedure (TCLP). An environmental laboratory can do this. Hazardous levels are published in *40 Code of Federal Regulations 261.24*. For mercury, the level is 0.2 milligrams per liter (mg/l). For lead, it is 5 mg/l. Levels are given for other toxic metals. If the TCLP metal levels are below these levels, the lamp is not hazardous.

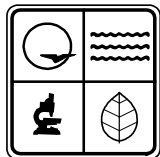
Non-hazardous lamp management

Some manufacturers produce “low-mercury” lamps, which may not test as being hazardous for mercury but still contain mercury. If your lamps are non-hazardous, you may send them to a lamp recycler or a Missouri sanitary landfill.

Small number of hazardous lamps

If your plant is a conditionally exempt small quantity generator (CESQG) of hazardous waste and you generate one or two hazardous lamps on an infrequent basis, you may dispose of them in a Missouri sanitary landfill, although collection for recycling is recommended.

Before landfilling any lamps, contact the landfill operator for permission. The operator may refuse any waste, or ask for evidence the lamps are not hazardous. Before disposal, put the lamp in the box the replacement lamp came in, put the boxed lamp in a plastic bag and secure the bag at the top before placing it in the dumpster. These precautions will help keep the lamp from breaking, protecting you and the trash hauler. The Missouri Department of Natural Resources encourages lamp recycling to safeguard human health and to limit the amounts of toxic heavy metals entering the environment.



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Hazardous lamp management

If your plant is a small quantity generator (SQG) or a large quantity generator (LQG) of hazardous waste and your lamps are hazardous, you can manage them as either hazardous waste or universal waste.

The universal waste rule, became effective in Missouri on Jan. 31, 1999, and is an alternative SQGs and LQGs may now use. If you manage your hazardous lamps as universal waste, you should read and become familiar with the requirements of both the state and federal universal waste rule.

Universal Waste

Unbroken hazardous lamps may be managed as universal waste rather than hazardous waste. The regulations vary for the size of the handler. A small quantity handler (SQH) can accumulate no more than 11,000 pounds of universal waste at any time. A large quantity handler (LQH) accumulates more than 11,000 pounds of universal waste at a time. Universal waste handler requirements include

- Label containers with the words “Universal Waste – Mercury- Containing Lamp(s)” or “Waste Mercury-Containing Lamp(s)” or “Used Mercury-Containing Lamp(s)”
- Store waste for no more than one year unless the storage will facilitate proper recovery or disposal.
- Train employees on proper handling and emergency procedures.
- LQGs must register with the department, store lamps so they are not easily broken and keep some records. LQG’s have additional requirements for worker training, storage area ventilation and having a mercury cleanup system.

A universal waste transporter does not need a Missouri hazardous waste transporter license. Shipments are made according to U.S. Department of Transportation requirements. Shipping papers rather than a hazardous waste manifest may be used. Universal waste lamps may be sent to another universal waste handler, a universal waste destination facility or to a Missouri facility with a resource recovery certification to accept mercury lamps. If you send hazardous lamps out of Missouri, contact the environmental agencies in the states that the lamps will travel to learn their requirements.

Remember

- Fluorescent lamps may be hazardous waste.
- You must manage hazardous lamps as hazardous waste if they are broken or if you choose not to manage unbroken bulbs as universal waste.
- If you generate one or two waste fluorescent lamps on an infrequent basis and you are a CESQG, you may send them to a Missouri sanitary landfill. Contact the landfill first for permission.
- Do not break fluorescent lamps.
- Do not use small drum-type fluorescent lamp crushers. Doing so is illegal treatment in Missouri.

Pollution Prevention Options

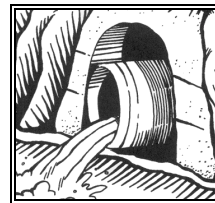
Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

- ✓ Purchase low-mercury lamps.
- ✓ Protect lamps from breakage.
- ✓ Recycle both hazardous and non-hazardous lamps.

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Jefferson City, MO 65102-0176*

Operator Certification

Wastewater
Systems



The proper operation and maintenance of wastewater facilities is essential to preventing the pollution of our streams, rivers and lakes. The Department of Natural Resources regulates the certification of wastewater operators. All operators of public or private wastewater treatment systems with 50 or more connections, or serving a population equivalent greater than 200, are required to possess a Level D Certification or higher.

Wastewater operator certification levels range from Level A to Level D. Level A is the highest certification level. An individual must pass a certification examination and have the required years of experience to receive a Certificate of Competency from the department. The Certificate of Competency must be renewed every three years. Operators must attend 30 hours of department approved renewal training prior to renewing their certificate.

Wastewater Treatment System Classification

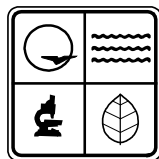
The department classifies wastewater treatment systems based on the operator skill level required to operate and maintain the systems. Treatment systems are classified using a point system. This system takes into consideration the design population equivalent, the design flow, discharge location, type of waste received, treatment processes used and operational testing required.

Treatment system classification levels range from Level A to Level D. Wastewater treatment facility supervisors are required to be certified at the same level, or a higher level, as the treatment system classification level. Supervisors are operators with direct responsible charge for the operations of the wastewater system or those who have authority to direct other operators. Superintendents, foremen, crew chiefs and shift supervisors are all "supervisors".

If you have questions regarding treatment system classification, operator certification, or renewal training, contact the Operator Certification and Training Unit of the Environmental Assistance Office at 1-800-361-4827 or (573) 526-6627.

Remember

- All operators must possess at least Level D certification.
- The operator Certificate of Competency must be renewed every three years.
- Operators must attend 30 hours of renewal training prior to certificate renewal.



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Preventing Pollution can save money, protect the environment and reduce risk to people.

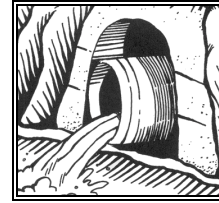
- ✓ Knowledgeable, well-trained operators help protect the environment through the careful operation and maintenance of wastewater systems.

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Permits

Wastewater Systems



The Missouri Department of Natural Resources regulates construction and operation of wastewater facilities. The department permits facilities for construction, modification, land disturbance, operations, land application and storm water management. The time period for getting a department permit varies depending upon the type of permit. Preparing the application, department engineering review, plan modifications and final permit issuance may take several months. Public notice and a thirty-day comment period are required for site specific permits. A public hearing is required if requested by a third party. Applications for department permits can be obtained from your Regional Office or the Water Pollution Control Program.

Land Disturbance Permits

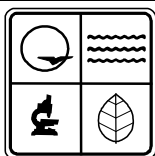
When you construct or make major modifications to a wastewater treatment facility, you may need a Land Disturbance Permit. If your construction project will require vegetation removal, grading, or excavating on an area of five acres or more, you will need a Land Disturbance Permit. Land disturbance sites one acre or more will require a permit beginning March 10, 2003. This is a general permit and does not require the thirty-day public notice period.

Land Disturbance Permits require the development of a Storm Water Pollution Prevention Plan (SWPPP) prior to disturbing the site. The SWPPP details the Best Management Practices (BMP's) that will be used at the site to reduce the amount of sediment and other pollutants in the storm water. Some common BMPs include site planning, maintaining vegetation, temporary re-vegetation, silts fences, straw bales and sediment basins.

Construction Permits

Before you build new wastewater facilities (including sewer lines) or modify existing systems, you must obtain a department construction permit. You will need to submit an engineering report, plans and specifications (prepared by a Missouri registered professional engineer); planning and zoning approval; a geological report; your completed application form and permit fee. Construction should not start before the permit is received.

When a treatment plant is finished, the engineer must provide the department a written construction certification and any test results. The certification attests to construction completion in accordance with the plans and specifications. When the sewer extensions are completed, the engineer must provide the department with a completed Letter of Authorization application, "as-builts," leakage test results and deflect test results. Each of these items are listed in conditions of the construction permit.



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Operating Permits

Wastewater treatment facilities are required to have an operating permit (NPDES permit) in order to discharge effluent. The operating permit will require the facility to periodically test the discharge and to file monitoring reports with the department. The type and frequency of testing depends on the type of facility and the particular body of water that receives the discharge. Operating permits are generally effective for five years. A renewal application must be submitted 180 days prior to permit expiration to maintain your permitted status.

If you plan to purchase a wastewater treatment facility that has a department operating permit, check with the department in advance to find out if the permit is transferable and how to transfer it. If you buy a permitted facility and transfer the permit, it is imperative that you get a copy of the entire permit application package from the previous owner and become familiar with it.

Land Application Permits

Construction and operating permits are required for land application of treated effluent or biosolids. Submit the completed application, fee, engineering report, plans and specifications, geological report and other documents as required. If your wastewater treatment plant has an operating permit, the land application permit is combined with it and no additional fee is required. A list of BMPs will be attached to the permit. It is very important that you follow the BMPs in order to stay in compliance with your permit.

Storm Water Permits

A storm water permit is required if your wastewater treatment facility has a design flow of 1 million gallons per day or more and it has a biosolids holding or disposal area on site. This permit will be combined with your operating permit.

Remember

- Contact your Department of Natural Resources' Regional Office for permitting requirements and applications.
- Read your permit carefully to help you identify what items must be submitted to the Department of Natural Resources

Pollution Prevention can save money, protect the environment and reduce risk to people. Here are some suggestions:

- ✓ During construction, re-vegetate your site as soon as possible. Use a temporary groundcover when possible.
- ✓ Following the BMPs in your permit will help you to operate your facility in an environmentally sound manner.

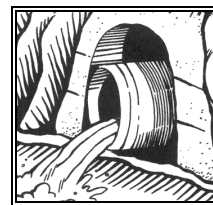
Additional Information:

Missouri Department of Natural Resources' permit regulations can be found at *10 CSR 20-6, Missouri Code of State Regulations* available on the Web at www.mosl.sos.state.mo.us/csr/10csr.htm.

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Pretreatment

Wastewater Systems



Pretreatment is the reduction, elimination or alteration of pollutants prior to discharge to a publicly owned wastewater treatment works (POTW).

The objectives of the national and state pretreatment standards are to

- prevent “pass through” of pollutants
- prevent “interference” with the treatment process
- protect the health and safety of operators
- protect municipal infrastructure
- improve opportunities to reuse municipal and industrial wastewater and biosolids.

Pretreatment standards prohibit the discharge of specific types of pollutants to a POTW. A sewer use ordinance is a tool that POTW’s can use to enforce these requirements. The sewer use ordinance should prohibit the discharge of wastes to the sewer system that

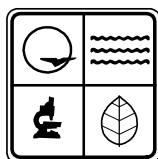
- could cause a fire
- could cause an explosion
- could cause corrosive structural damage
- could obstruct the flow of sewage through the system
- have a pH less than 5
- have a temperature greater than 104 degrees Fahrenheit.

In addition, the sewer use ordinance should prohibit or regulate the introduction of

- high-strength oxygen-demanding wastes and toxic wastes
- oil or oil products that cause interference or pass-through
- trucked or hauled pollutants except at POTW designated discharge points.

POTW’s with design flows greater than five mgd are required to develop an industrial pretreatment program. Smaller POTW’s that have Significant Industrial Users may also be required to have industrial pretreatment programs. Significant Industrial Users include

- industrial users subject to categorical pretreatment standards
- industrial users that discharge an average of 25,000 gpd or more of process wastewater to the POTW



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- industrial users that discharge process wastewater in amounts equal to or greater than five percent of the average dry weather hydraulic or organic capacity of the POTW
- other industrial users that the department designates as having the potential to adversely affect the operation of POTW.

Pollution Prevention

Preventing pollution by reducing, reusing or recycling process wastes can help protect the environment, reduce risk to workers and reduce production costs for waste handling, treatment and disposal. Here are some ideas for pollution prevention that POTW's can forward to their industrial and commercial users:

- ✓ Implement inventory controls to minimize waste due to expiration dates.
- ✓ Implement spill prevention and spill containment measures.
- ✓ Segregate hazardous waste streams from non-hazardous waste streams.
- ✓ Plan production runs to maximize production and minimize waste.
- ✓ Substitute nontoxic materials for toxic materials where practicable.
- ✓ Evaluate available technology changes to reduce or eliminate toxic wastes.
- ✓ Consider product changes to reduce problem pollutants.
- ✓ Reuse or reclaim spent input materials.

Additional information:

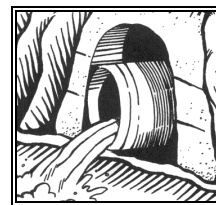
Missouri Department of Natural Resources regulations are available at www.mosl.sos.state.mo.us/csr/10csr.htm.

Pretreatment Facility Inspection, Third Edition, 1996.

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March 2002

Safety For Wastewater Systems



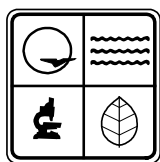
Safety programs should be an integral part of all wastewater systems. The wastewater field has an accident frequency rate second only to the mining industry. Implementing a safety program to protect the health and safety of your employees is a key function of your wastewater management system.

Hazard identification is an important part of a safety program. Potential hazards at wastewater treatment systems include

- Confined space gases
- Trench collapse
- Falls due to slick or wet work surfaces
- Exposure to disease causing organisms (pathogens)
- Over exertion due to lifting, pushing or pulling heavy objects
- Injury from motor vehicles, heavy equipment and tools
- Exposure to hazardous chemicals
- Exposure to excessive noise
- Electrical hazards
- Hazardous energy – stored in electrical circuits, springs, hydraulic systems, pneumatic systems, pressure vessels
- Flammable and combustible liquids
- Lab equipment and procedures.

Once possible hazards have been identified, find ways to limit employee exposure to the hazards. Methods of limiting exposure include

- Hazard elimination
- Proper training
- Engineering controls (railings, non-slip surfaces, blocking and binding)
- Safe work practices (entry by permit only, lockout or tagout procedures)
- Personal protective equipment (goggles, safety shoes, gloves, face shields, hard hats, respirators, hearing protection)
- Hazard communication
- Proper training
- Good supervision.



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A well-designed safety program protects the wastewater utility as well as the employees. Your facilities safety record affects the costs for liability insurance, lawsuits, worker compensation insurance and lost time on the job. Elements of a safety program should include

- Management support of safety program
- Assignment of responsibility (i.e. a safety director)
- Supervisor and employee training
- Accountability
- Hazard identification and control
- Record keeping
- First-Aid and CPR training
- Accident investigation
- Employee awareness, acceptance and participation
- Material Safety Data Sheet file for all chemicals on-site (yellow folder – red lettering)

Additional Information Sources:

Water Environment Federation (WEF), www.wef.org, has safety books and video tapes available for purchase including

- *MOP 1 Safety and Health in Wastewater Systems*
- *Supervisor's Guide to Safety and Health Programs*
- *Protecting Workers from Exposure to Chemical and Physical Hazards at Wastewater Treatment Plants*

Association of Federal, State, County and Municipal Employees (AFSCME),
www.afscme.org/health/riskybtc.htm:

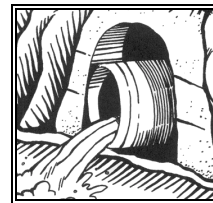
- *Risky Business: An AFSCME Health and Safety Guide for Water and Wastewater Treatment Plant Workers*

Utility Safety Magazine, www.utilitysafety.com

*For more information call 1-800-361-4827 or write to
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Sludge Biosolids

Wastewater Systems



Sludge, a by-product of the wastewater treatment process, is the settleable solids that are separated from the liquids. No matter what type of treatment process you have, at some point in time, sludge must be removed from your system to keep it functioning properly.

Mechanical treatment processes require routine sludge removal. Treatment processes using septic tanks or lagoons require less frequent sludge removal. Proper sludge management is an important tool in meeting permit discharge limits and preventing pollution.

Sludge removed from the system must be either disposed of, or treated and recycled. Treated sludge that meets the treatment standards of the federal “503 regulations” (40 CFR 503) is called a “biosolid”. Biosolids can be recycled for use as a fertilizer or soil amendment.

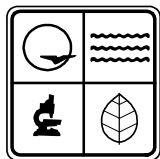
The Standard Conditions Part III and the Water Quality Guides attached to your Missouri NPDES Operating Permit give the state’s requirements for handling sludge and biosolids removed from domestic wastewater treatment facilities. Your permit requires you to annually report the amount of sludge or biosolids removed from the system. The *Annual Report Form S – Domestic Sludge* is due January 28 of each year. Systems using lagoons need only file the report in years that they remove sludge or close the lagoon.

Remember

- Adequate sludge treatment, storage and handling capacity are essential to maintaining permit compliance and preventing pollution.
- The Annual Form S Sludge Report is due January 28 each year.

Preventing Pollution can save money, protect the environment and reduce risk to people. Here are some suggestions:

- ✓ Remove solids from lagoons when they amount to 25-30 percent of capacity.
- ✓ Plan now for the cost of future lagoon sludge removal.
- ✓ Have adequate sludge or biosolids storage capacity for time periods when you are unable to land apply or transport to a disposal facility.



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- ✓ Cover dewatered biosolids storage areas to prevent rewetting.
- ✓ Follow best management practices when land applying biosolids:
 - Apply biosolids at agronomic rates.
 - Observe required buffer zones for water supplies, ponds, lakes, streams, dwellings and property lines.
 - Observe crop, harvest and grazing restrictions.
 - Observe slope limitations.
 - Do not allow biosolids to discharge from land application sites.
 - Observe soil pH and phosphorus limitations.
 - Keep accurate records for at least five years.
 - Have adequate land application sites to handle biosolids if one of your application sites becomes unavailable.
 - Follow “good neighbor” practices when land applying biosolids.

Additional Information:

National Biosolids Partnership - www.biosolids.org

Missouri Department of Natural Resources regulations can be found at *10 CSR 20-8, Missouri Code of State Regulations* available on the Web at www.mosl.sos.state.mo.us/csr/10csr.htm.

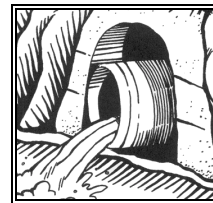
Operation of Wastewater Treatment Plants, Volume II, Fourth Edition, 1996.

For more information call 1-800-361-4827 or write to
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Environmental Assistance Office
P.O. Box 176
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March 2002

Solid Waste

Wastewater Systems



Wastewater Treatment operations produce solid waste. The Department of Natural Resources regulates the disposal and management of solid waste in several ways.

Note: hazardous wastes are discussed in Guide Sheet #7 of this series.

Disposal

Most solid waste must be disposed of at a permitted sanitary landfill. In some areas where no landfill is close by, a transfer station is used as a collection point before transporting wastes to the sanitary landfill. Landfill and transfer station permits are issued by the department's Solid Waste Management Program (SWMP). SWMP can give you a list of all permitted landfills and transfer stations in the state.

Landfills may not accept wastes that have visible liquids in them. They also do not accept hazardous materials, major appliances, used oil or car type batteries. Landfills may also refuse other wastes they think will cause operating problems for them. Before you take waste to a landfill, call their office to make sure the landfill accept your waste.

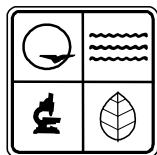
The department does not regulate the storage and hauling of wastes. However, storage and hauling may be regulated or restricted by city or county ordinances. When wastes are accumulated for too long they often become unsightly, odorous and hazardous to human health. The department's regional offices respond to citizen complaints about such situations and often require the wastes to be cleaned up.

It is illegal for facilities to dispose of solid wastes by burning unless they have first obtained a permit for an incinerator from the department's Air Pollution Control Program.

Management of Solid Wastes

You can decrease the amount of solid waste you need to dispose of in several ways. Evaluate the things you dispose of on a regular basis. Accumulate and recycle aluminum cans, glass containers, office paper and other recyclables. Purchase chemicals, paints and other products in appropriate sized containers:

- order in bulk to reduce costs and packaging waste; however, ...
- don't buy more than you need; products kept past their expiration date become waste.



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Product packaging can often be reused or recycled. An area cardboard recycler can help you learn how to manage your cardboard for recycling. Pallets can be recycled or repaired and reused by local businesses and others. For example: pallets can be used to build yard waste composting bins.

Remember

- Landfills do not accept liquid wastes.
- It is illegal for facilities to burn solid waste for disposal.
- Many waste materials can be recycled decreasing the amount of waste needing disposal.

Preventing Pollution can save money, protect the environment and reduce risk to people. Here are some suggestions:

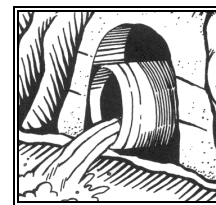
- ✓ Sort waste materials when they are produced to make recycling easier and more productive.
- ✓ Keep outside storage areas neat and develop a regular schedule for taking recyclables to a recycling center.
- ✓ Store solid waste in ways that protect it from rain and prevent vermin breeding.
- ✓ Place waste storage containers away from wells and other source water.

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March 2002

Used Oil Recycling and Disposal

Wastewater
Systems



Vehicle and equipment maintenance operations at wastewater treatment facilities can generate used oil. Used oil is regulated under the federal and state hazardous waste laws and regulations. Used oil includes petroleum-derived and synthetic oils used for lubrication, cutting oil, heat transfer or hydraulic power.

Improper disposal of used oil can cause damage to groundwater and surface water and wastes a valuable resource. Improper disposal includes placing oil in the trash, or applying it to gravel roads or parking lots to kill weeds or suppress dust.

The Missouri Department of Natural Resources encourages facilities to recycle their used oil. Recycling used oil protects the environment and saves money. If you do not recycle your used oil, it is regulated as a hazardous waste (see the *Hazardous Waste Guide Sheet #7*).

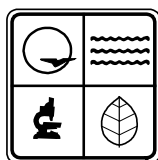
Space Heaters

Facilities may burn their own used oil in specially designed used oil space heaters. Used oil space heaters must have a capacity of 500,000 BTU per hour or less and be vented outside. You may also collect used oil from household do-it-yourselfers and exempt farmers to burn in your space heater. If you are collecting used oil from do-it-yourselfers or farmers you need to notify the department and you must follow management standards for used oil collection sites. Contact the department for the technical bulletin *Management Standards for Used Oil Collection Centers*.

Used Oil Management

Facilities need to follow management standards when they store and transport used oil:

- Label storage tanks and containers "Used Oil."
- Keep storage tanks and containers in good condition.
- Keep containers and tanks closed unless adding or removing liquid.
- Transport of 55 gallons or less of used oil to a collection center or aggregation point may be done using your own vehicle or that of an employee.
- Transport of more than 55 gallons of oil must be done by a department licensed transporter. (Contact the department for a list of transporters).



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Mixtures

Facilities should not mix hazardous waste with used oil. Mixing hazardous waste with used oil will make the entire volume of used oil a hazardous waste. For example, mixing F-listed spent solvents with used oil will cause all of the oil mixture to be hazardous waste.

Regulations allow for one exception. If you are a conditionally exempt generator of hazardous waste that is only hazardous because it is ignitable, you may mix it with your used oil for burning. However, this practice can damage the space heater and release hazardous emissions into the environment. **Before adding anything to your used oil**, check with the department, your used oil transporter and your used oil space heater manufacturer to make sure that practice is acceptable. See the Hazardous Waste Guide Sheet #7 for the definition of a conditionally exempt small quantity generator.

If you have questions about managing used oil, contact the department's Hazardous Waste Program at (573) 751-3176 or 1-800-361-4827.

Remember

- You cannot send used oil to a landfill or pour it out onto the ground.
- If you are not recycling your used oil, it must be managed as a hazardous waste.
- If someone else is hauling your used oil, they must have an EPA identification number and be registered with the department.
- You may burn your own used oil in a used oil space heater. Its capacity must be 500,000 BTU/hour or smaller and it must be properly vented.
- If you notify the department that you are a do-it-yourself (DIY) used oil collection center, you may collect and burn used oil from household DIYers and exempt farmers.

Pollution Prevention can save money, protect the environment and reduce risk to people. Here are some suggestions:

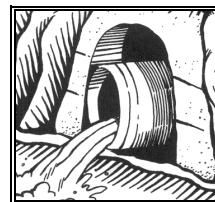
- ✓ Keep used oil separate from other wastes.
- ✓ Place oil-laden parts on a drip pan rather than on the floor.
- ✓ Do not use the oil drip pan to collect antifreeze or solvent.

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March 2002

Wastewater Contacts

Wastewater
Systems



Technical Contacts

Crowder College Environmental Resource Center

1-800-848-8726

Provides on-site wastewater system operator training.

Midwest Assistance Program

1-800-822-2981

www.map-inc.org

Provides technical assistance, training, and wastewater system troubleshooting.

Missouri Department of Natural Resources

Regional Offices

Call Environmental Assistance Office at 1-800-361-4827 for referral.

Provides permitting and technical assistance for sewerage projects.

Missouri Department of Natural Resources

Environmental Assistance Office

1-800-361-4827 or (573) 526-6627

www.dnr.state.mo.us/deq/tap/hometap.htm

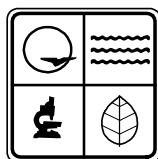
Provides training, wastewater system troubleshooting and operator certification services. The Missouri Municipal Water Pollution Prevention (MWPP) survey is a self-survey to assess your system's Technical, Managerial, and Financial (TMF) capacity. The Wastewater User Charge Analysis software is used to analyze user rates, financial condition and more.

Missouri Rural Water Association

(573) 474-6990

www.moruralwater.org

Provides technical assistance, training, wastewater systems troubleshooting and member services.



MISSOURI DEPARTMENT OF NATURAL RESOURCES

Environmental Assistance Office

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Financial Contacts

Missouri Department of Economic Development

(573) 751- 4146

www.ecodev.state.mo.us/ded

Provides community development block grants; industrial development grants and loans; and emergency loans for various projects.

Missouri Department of Natural Resources

Water Pollution Control Program

1-800-361-4827

Provides grants, loans and other financial assistance for sewerage projects.

Missouri Rural Opportunities Council

(573) 751-1238

www.moroc.org

Organizes rural community improvement projects and initiatives.

Regional Planning Commissions

Call Environmental Assistance Office for Planning Commission office that serves your area.

(573) 526-6627 or 1-800-361-4827

Provides municipal management assistance, project planning, grant applications and other training.

U.S. Department of Agriculture, Rural Development

(573) 876-0995

www.rurdev.usda.gov/mo

Provides rural community development grants and loans for various projects.

For more information call 1-800-361-4827 or write to

Missouri Department of Natural Resources

Environmental Assistance Office

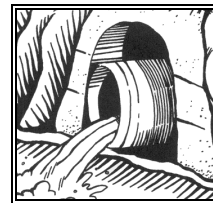
P.O. Box 176

Jefferson City, MO 65102-0176

March 2002

Wastewater Laboratories

Wastewater Systems



Laboratory chemicals at wastewater treatment facilities can be a potential hazard to people and the environment. Special care should be taken in their storage, handling, use and disposal. Taking steps to prevent spills and knowing how to react in case of an accident can help prevent injuries and protect the environment.

Written Safety Plan - A written safety plan is a useful tool to have at the lab. It serves as a reference for training and is needed for legal liability purposes. It should include

- safety rules
- safety training requirements
- safety equipment list
- chemical storage guidelines

- emergency action plan
- lab accident procedures
- hazardous chemical list
- proper disposal procedures

Safety Officer - Having a designated safety officer helps to insure that safety procedures are in place and they are followed. Safety Officer's responsibilities:

- maintain Material Safety Data Sheet library
- inspect workplace
- maintain safety equipment

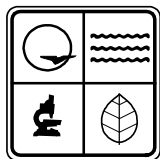
- organize training
- indoctrinate new employees
- enforce safety rules

Personal Safety Equipment - Have available and use the appropriate safety equipment. This includes eye and face protection, proper gloves, lab coats and respirators.

Lab Safety Equipment - This includes fire extinguishers, fume hoods, safety shower and eyewash.

Waste Minimization - Purchasing/inventory: Buy chemicals in the smallest practical quantities. Evaluate cost savings of bulk purchases versus the cost of disposing of unused chemicals. Use first in, first out inventory control to minimize expired chemicals. Substitute chemicals with less toxic alternatives. Always use the minimum amount of chemical required. Label all chemical containers properly.

Spill Prevention/Containment - Store glassware and breakable containers on textured rubber mats. Order chemicals in plastic coated bottles. Transport solvent bottles in protective holders. Keep doors of chemical storage cabinet latched. Equip chemical storage shelves with barriers one-fifth the height of the tallest container. Segregate incompatible chemicals in separate storage cabinets or by physical barriers. Keep all counter top chemicals in a tray or within bermed areas.



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Water Quality Protection - Never store chemical bottles and containers in sinks. Surround sinks and counter tops with a protective lip. Plug all floor drains. Protect safety shower drain from chemical spills with temporary plugs or sumps. Maintain adequate and readily available supply of spill cleanup materials. Check chemical disposal guidelines prior to discharging to a drain. Do not dispose of hazardous wastes down the drain.

Remember

→ Following safety rules protects people, the environment and liability exposure.

Preventing Pollution can save money, protect the environment and reduce risk to people. Here are some suggestions

- ✓ Keep work areas clean and well organized to help prevent accidents.
- ✓ Use drip pans and splash guards where spills frequently occur.
- ✓ Don't buy more than you need. The leftovers may become waste.
- ✓ Purchase the least toxic or hazardous product available. Check the material safety data sheets for products you purchase. If the product is toxic or hazardous, ask your supplier for alternatives.
- ✓ Use the oldest items first (first-in, first-out).
- ✓ If you do have excess or unneeded materials, see if your supplier can take them back.
- ✓ Include the cost of disposal when you make purchasing decisions. What looks like the cheapest option may cost more because of disposal or other management costs.
- ✓ Store materials in a way that keeps them from being damaged.
- ✓ Make sure all items are clearly labeled. Store products in original containers.

Additional Information:

Safety in the Chemical Laboratory, Volumes 1-4, Norman V. Steele.

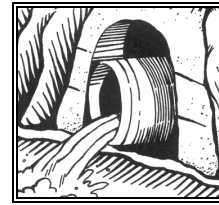
General Industry OSHA-Safety and Health Standards, (CFR, Title 29, Labor Pt.1900-1910).

For more information call 1-800-361-4827 or write to
Missouri Department of Natural Resources
Environmental Assistance Office
P.O. Box 176
Jefferson City, MO 65102-0176

March 2002

Wastewater System Management

Wastewater
Systems



The mission of the wastewater industry is to protect water quality and human health. Your utility's ability to consistently deliver a reliable and cost effective service, and prevent pollution, is dependent on its management capabilities. The **technical, managerial and financial capacities** of your wastewater system are factors that determine your utility's capability to prevent pollution.

Your utility's **technical capacity** includes the facilities, machinery and equipment of your system, and the people who operate and maintain your system.

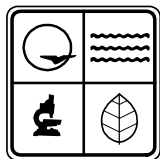
Your utility's **managerial capacity** includes the management structure and people who make policy decisions and handle accounting, billing, purchasing, safety, staffing, internal communications and public relations.

Your utility's financial capacity includes the financial resources, policies and practices of your utility such as budgeting, financial reporting, user fee rate setting and collection and capital improvements planning.

If these three aspects of your utility are functioning well, your utility should be able to comply with present and future environmental regulations.

Tools for maintaining and developing **technical capacity**:

- Maintenance programs for collection and treatment systems
- Trained and certified operators
- Continuing education for employees
- Adequate staffing
- Adequate equipment



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Tools for maintaining and developing **managerial capacity:**

- Organizational chart with clearly defined lines of authority
- Written job descriptions and selection criteria
- Written accounting and audit procedures
- Bond insurance for employees who handle funds
- Written billing and collection procedures
- Written purchasing and inventory control procedures
- Written procedures for handling customer complaints
- Internal communication programs (newsletters, bulletin board, staff meetings)
- Public relations program (newsletters, news releases, bill fliers, open house)
- Sewer use ordinance in place
- Safety program
- Emergency plan

Tools for maintaining and developing **financial capacity:**

- Wastewater utility set up as a separate enterprise fund and budgeted separately
- Annual wastewater budget
- Monthly report of revenues and expenses to decision making body
- Emergency operation and repair funds budgeted
- Separate reserve account for equipment repair and replacement
- Capital improvements plan
- Calculate operating ratio, coverage ratio and average treatment costs
- User charge ordinance in place
- Frequent review of user charge rates and a projection of future financial condition

Remember

→ Building a strong management program will help ensure your utility's ability to prevent pollution and comply with environmental regulations.

*For more information call 1-800-361-4827 or write to
Missouri Department of Natural Resources
Environmental Assistance Office
P.O. Box 176
Jefferson City, MO 65102-0176*